

REMARKS

As previously pointed out, the invention is an improved webbing retractor of the type having a retracting shaft for retracting a webbing belt that restrains an occupant; a lock mechanism which includes an annular lock gear with ratchet teeth being formed at an annular outer peripheral face of the lock gear with ratchet teeth being formed at an outer peripheral face of the lock gear and a lock plate engageable therewith to prevent rotation of the retracting shaft in a webbing pulling-out direction, a force limiter mechanism which includes a torsion bar having one end portion coupled to the retracting shaft, and a pretensioner mechanism which includes a sleeve coupled to the other end portion of the torsion bar, and which is structured to be able to forcibly rotate the retracting shaft in a webbing retracting direction via the sleeve.

In contrast to the prior art, the annular lock gear is **concentrically mounted** with respect to an axis of rotation of said retracting shaft, and the sleeve of the pretensioner mechanism is **integrally connected** at an axial center portion of the lock gear of the lock mechanism **such that the sleeve and the lock gear form a single, one piece member**, thereby advantageously reducing the number of parts and reducing the over-all size of the retractor. The invention is best seen in Figures 2 and 3. Note annular lock gear 70 with sleeve 72 integrally formed therein such that the lock gear 70 and sleeve form a single piece.

Claim 1 has been revised to more clearly recite the structural features that allow the lock gear and the sleeve to be integrally formed. Amended claim 1 now recites a lock mechanism including

“an annular lock gear concentrically mounted with respect to an axis of rotation of said retracting shaft with ratchet teeth being formed at an outer annular peripheral face of the lock gear and a lock plate disposed to be able to be engaged with the ratchet teeth of the lock gear,...

wherein the sleeve of the pretensioner mechanism is integrally connected at an axial center portion the lock gear of the lock mechanism such that the sleeve and the lock gear form a single, one piece member.”

Support for this amendment is present in the third paragraph of page 12 of the specification, reproduced hereinbelow:

In the present webbing retractor 10, the sleeve 72 and the sleeve extension portion 73 forming the pretensioner mechanism 50 are formed integrally with the axial center portion of the lock gear 70 of the lock mechanism 130. In this manner, in the webbing retractor 10, a lock gear (corresponding to the lock gear main body 74 and the ratchet teeth 76 in the embodiment) of a clutch mechanism and a sleeve (corresponding to the sleeve 72 and the sleeve extension portion 73 in the embodiment) of a pretensioner mechanism which have been separate members in prior art **are formed integrally and therefore one member can have two functions**. As a result, it is possible to suppress the number of parts of the webbing retractor 10. Since the number of parts of the webbing retractor 10 can be suppressed, it is possible to miniaturize the webbing retractor 10. (Emphasis added.)

None of the references of record either discloses or suggests the webbing retractor defined in amended claim 1. The Grabinski '694 patent discloses only a cable-type tensioning mechanism for a seat belt reel in mechanism. In contrast to the specifically recited **"annular lock gear concentrically mounted** with respect to an axis of rotation of said retracting shaft,..." the locking mechanism disclosed in this reference comprises an **elliptical** locking member 14 (see Figure 1) that is disclosed as being **"[e]ccentrically mounted** on the cable pulley 10" (see column 3, line 44). As set forth in column 4, lines 9-12:

If there is now a crash and the cable 12 is unwound from the cable pulley 10, **the locking member 14 is shifted radially outwardly** until the outer teeth 15 of the locking member 14 mesh with the coupling teeth 16. (Emphasis added.)

Hence, there is simply no disclosure or even suggestion of the recited **"annular lock gear concentrically mounted** with respect to an axis of rotation..." in the Grabinski '694 patent. Moreover, there is no disclosure or suggestion of the specifically recited "sleeve of the pretensioner mechanism [that] is **integrally connected** at an axial center portion of the lock gear of the lock mechanism" While this patent does disclose a flange 18 protruding from cable pulley 10 (see Figure 2), it is no way connected to the locking member 14, much less **"integrally connected at an axial center portion of the lock gear such that the sleeve and the lock gear form a single, one piece member ..."** as recited in claim 1. Thirdly, as admitted by the Examiner himself in the last office Action, there is no disclosure or suggestion in this reference of the recited **"a force limiter mechanism** which includes a **torsion bar** having one end portion coupled to the retracting shaft, and which is structured to

be able to absorb a rotating force of the retracting shaft in the webbing pulling-out direction when the rotation of the retracting shaft in the webbing pulling-out direction is prevented by the lock mechanism...” (emphasis added). Accordingly, claim 1 is clearly patentable over this reference, taken singly.

The Butenop ‘108 patent is similarly irrelevant to the invention recited in amended claim 1. On page 3 of the last Office Action, the Examiner equates the ring segments 22 and the locking member 24 with the sleeve and lock gear recited in claim 1. However, column 4, lines 53-66, describes these components as follows:

Disposed on that side of the cable pulley 15 which faces the safety belt reel-in mechanism 10, and disposed concentrically to the seating of the cable pulley 15 on the shaft extension 17, are two ring segments 22 which project from the plane of the cable pulley 15, and between which are disposed the spaces 23. Eccentrically mounted on the ring segments 22 is a locking member 24 which has a central opening 25 and a partial set of peripheral teeth 26. The eccentric point E for the eccentric mounting of the locking member 24 on the ring segments 22 of the cable pulley 15 is located beyond the locking member 24, as a result of which the latter can be moved along a circular path 27 about an angle which is necessary for the pivoting movement. The central opening 25 of the locking member 24 has a butterfly-like shape, with the inwardly directed bearing projections 28, depending upon the position of the locking member 24, extending into the spaces 23 between the ring segments 22 of the cable pulley 15.

Clearly, the **elliptical** locking member 24 (see Figure 2) is **not** “annular”, nor “concentrically mounted” with respect to an axis of rotation of said retracting shaft,” nor are the ring segments 22 “integrally connected at an axial center portion of the lock gear of the lock mechanism.” Rather, the **elliptical** locking member 24 is **eccentrically** mounted in spaces provided in the ring segments 22 (see Figure 1) so as to **lag behind** the ring segments in operation (see column 5, lines 48-51). Thus the locking member 24 and the ring segments **cannot** be “integrally connected such that the sleeve and the lock gear form a single, one piece member”. For all these reasons, amended claim 1 is clearly patentable over the Butenop ‘108 patent. Moreover, as was the case with the Grabinski ‘694 patent, there is no disclosure or suggestion in this reference of the recited “a **force limiter mechanism** which includes a **torsion bar** having one end portion coupled to the retracting shaft, and which is structured to be able to absorb a rotating force of the retracting shaft in the webbing pulling-out direction

when the rotation of the retracting shaft in the webbing pulling-out direction is prevented by the lock mechanism...” (emphasis added).

Finally, all that the Nagata ‘528 patent discloses is a webbing retractor having a lock plate 206 (see Figure 27) that is essentially arc-shaped and which slides via cam action into the ratchet teeth 96A of a ratchet hole 96 formed in the leg plate of the frame 20 (see Figure 1, and column 21, lines 10-19). Hence the Nagata ‘528 patent neither discloses nor suggests the specifically recited “annular lock gear concentrically mounted with respect to an axis of rotation of said retracting shaft”. Additionally, and even more importantly, the sleeve 78 (shown in Figure 14) is not “integrally connected at an axial center portion of the lock gear of the lock mechanism such that the sleeve and the lock gear form a single, one piece member ...”, as is specifically recited at the end of the claim. By contrast, the sleeve 78 and the lock plate 206 are completely separate and discrete mechanical components, in direct contravention to the overall purpose of the invention, which is to advantageously reduce the number of parts and the over-all size of the retractor. For all these reasons, amended claim 1 is clearly patentable over the Nagata ‘528 patent.

Nor can amended claim 1 be rendered “obvious” under 35 USC over any tenable combination of the Nagata ‘528, Butenop ‘108, and Grabinski ‘694 patents, for two reasons. First, none of these patents discloses either the recited “annular lock gear concentrically mounted with respect to an axis of rotation of said retracting shaft with ratchet teeth being formed at an annular outer peripheral face of the lock gear....” Second, none of these references discloses the recited “sleeve of [a] pretensioner mechanism ... integrally connected at an axial center portion of the lock gear of the lock mechanism such that the sleeve and the lock gear form a single, one piece member.” Even more importantly, all of these references essentially **teach against** the recited “sleeve of the pretensioner mechanism [that] is **integrally connected** at an axial center portion of the lock gear of the lock mechanism such that the sleeve and the lock gear form a single, one piece member” For example, the Butenop ‘108 retractor would be rendered **inoperative** if the locking member 24 were integrally connected to the ring segments 22. In the Nagata ‘528 retractor, the sleeve 78 and the lock plate 206 are completely separate and discrete mechanical components, in direct contravention to the overall purpose of the invention, which is to advantageously reduce the number of parts and the over-all size of the retractor. Finally, notwithstanding the fact that the Grabinski ‘694 patent fails to disclose any type of pretensioner sleeve at all, its

disclosure of a non-annular locking plate 14 that moves in a **radial** direction is clearly incompatible with the provision of a pretensioner sleeve that "is integrally connected at an axial center portion the lock gear of the lock mechanism."

The Examiner's citation of the Lee '747 patent is noted. However, no discussion of this reference is deemed necessary in view of its general irrelevancy to the claimed invention.

Claim 2 is patentable by virtue of its dependency on amended claim 1.

Claim 3 includes all of the previously discussed limitations with respect to claim 1 and is therefore patentable for all the same reasons.

Claim 4 is dependent on amended claim 3 and is therefore patentable at least by reason of such dependency.

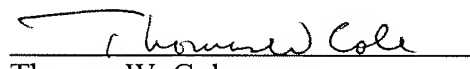
Claim 5 has been amended to include all of the same limitations as discussed with respect to claim 1. Accordingly claim 5 is patentable.

Claims 6, 7 and 8 have been cancelled, since the limitations therein have been incorporated into claims 1, 3, and 5, respectively.

Now that all of the claims are believed to be patentable, the prompt issuance of a Notice of Allowance is earnestly solicited.

Respectfully submitted,

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